

REMARKS

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.112 and in light of the remarks which follow, are respectfully requested.

Claims 8 and 11 have been cancelled and claims 1 and 9 have been amended, at least partly in response to issues raised in the Office Action. Support for the amendments to claims 1 and 9 may be found, for example, on pages 12-14 of the specification.

Mixtures of dyes are disclosed on page 30, lines 4-5. Support for the feature in new claims 13 and 14 may be found, for example, on page 30, lines 13-14 of the specification.

Claims 1, 2, 5, 9, 10, 13 and 14 are now pending in the application.

Turning to the Office Action, claim 11 was objected to for the reason set forth in paragraph (2) of the Office Action. Also, claim 11 was rejected under 35 U.S.C. §112, second paragraph, for the reason expressed in paragraph (6) of the Office Action. With the cancellation of claim 11, both the objection and §112 rejection have been obviated.

Claims 1, 2, 5 and 8-11 were rejected under 35 U.S.C. §112, first paragraph, for the reason set forth in paragraph (4) of the Office Action. Reconsideration of this rejection is requested for the following reasons.

It is well established that the written description requirement of 35 U.S.C. §112, first paragraph, is satisfied if the specification conveys clearly to those skilled in the art the information that the applicant has invented the specific subject matter claimed. It is also well settled that the subject matter need not be literally described for the specification to satisfy the description requirement. See §2163, M.P.E.P.

The Examiner states that there is no written description in the application for the expression "contained in an amount of not less than 2 weight %". While the quoted phrase is not literally in the disclosure, it does not have to be for the reasons given above. The minimum amount of glycerol shown in the examples is 2 wt%. This provides support for the lower limit of the recited range, i.e., at least 2 wt%, or in other words, "not less than 2 wt%."

The Examiner contends further that the quoted range encompasses all amounts greater than 2 wt%. Applicants respectfully disagree. Claims 1 and 9 specify that the ink has a viscosity of 50 cp or lower at 25°C. Glycerol is a viscous syrupy liquid. Its presence in the formulation obviously has an effect on the viscosity of the formulation. Those of ordinary skill in the art would clearly recognize that the viscosity limit of 50 cp inherently and implicitly defines the upper limit on the amount of glycerol present in the ink.

In view of the above remarks, applicants respectfully request that the §112, first paragraph, rejection be reconsidered and withdrawn.

Claims 1, 2, 5 and 8-11 were rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent 5,973,025 to Nigam et al either alone or in view of U.S. Patent 5,958,999 to Bates et al and U.S. Patent 5,665,150 to Schwarz for reasons set forth in paragraph (9) of the Office Action. Reconsideration of this rejection is requested in view of the above amendments and the following comments.

The present claims, as amended, now specify that the printing inks of the invention include a basic polymer having a side-chain comprising a 1-imidazolyl group, glycerol in

an amount of not less than 2 wt%, and at least one azomethine and/or azo dye selected from those encompassed by formulae III, IV, V or VI. As shown by the data in Table 1 on page 39 of the specification, printing inks containing the above recited components provide images of excellent hue and resistance to light on photographic paper as well as "genuine paper", i.e., gloss paper sheets of general use. The cited references do not disclose or suggest the claimed inks for at least the following reasons.

Nigam '025 discloses ink compositions containing a binder material which is designed to ionically or physically entrap the colorant. Suitable binder materials include polymers selected from Groups A, B, C or D (column 10, lines 47-51). Other additives which may be present encompass a lengthy list of ingredients including glycerol. The list of colorants in columns 9 and 10 of Nigam '025 does not appear to include any of the azo or azomethine dyes of formulae III, IV, V or VI. None of the specific working examples in Nigam '025 discloses an ink composition containing a polymer having a 1-imidazolyl group and glycerol. Thus, the disclosure of Nigam '025 taken as a whole, fails to suggest a printing ink as claimed herein.

Bates '999 is relied upon by the Examiner for a disclosure of printing inks containing polymers having 1-imidazolyl side groups. Schwarz '150 is relied upon for a disclosure of inks containing glycerol. However, the disclosures of the secondary references fail to supply the deficiencies of Nigam '025 for the following reasons.

Bates '999 discloses ink compositions which contain polymers selected from those containing a 1-imidazolyl group, those derived from vinyl pyridine, and polyethylene-imines. A list of additives includes glycerol. There are no specific examples of

formulations containing polymers having 1-imidazolyl side-chains and glycerol. There is nothing in Bates '999 which would motivate those skilled in the art to select polymers containing 1-imidazolyl groups as opposed to any of the other polymers described therein.

Schwarz '150 does not disclose inks containing polymers with 1-imidazolyl side-chains, let alone a combination of glycerol and such a polymer.

Applicants submit that there is no motivation which would lead those skilled in the art to select glycerol and polymers containing 1-imidazolyl side-chains from the extensive list of polymers and additives set forth in the cited art. And, even if the disclosures of the references were combined, the resultant ink compositions would not contain the components specified in the present claims, i.e., a polymer having 1-imidazolyl side-chains, glycerol and a dye of formulae III, IV, V and VI.

For the above reasons, the present claims are not obvious over the disclosure of Nigam '025 taken alone or with Bates '999 and Schwarz '150. Accordingly, the §103(a) rejection based on these references should be withdrawn.

Claims 1, 2, 5, 8, 9 and 11 stand rejected under 35 U.S.C. §103(a) as unpatentable over Bates '999 in view of U.S. Patent 5,938,827 to Breton et al, Nigam '025 and Schwarz '150 for the reasons set forth in paragraph (10) of the Office Action. Reconsideration and withdrawal of this rejection is requested in view of the above amendments and the remarks which follow.

Bates '999, as discussed above, discloses ink compositions which may contain any one of a variety of polymers and additives from a lengthy list which includes glycerol. There is no teaching in Bates '999 which would specifically direct those of ordinary skill in

the art to combine polymers containing 1-imidazolyl side-chain with glycerol. Further, Bates '999 does not disclose azomethine or azo dyes of the formulas set forth in the present claims.

Breton '827 is relied upon solely for its disclosure of inks containing Fast Black 2, an azo dye. Fast Black 2 is not an azo dye of formulae V or VI of the instant claims. Breton '827 does not disclose inks containing polymers having 1-imidazolyl groups or combinations thereof with glycerol.

The disclosures of Nigam '025 and Schwarz '150 have been discussed above. Neither reference discloses or suggests ink compositions containing polymers having 1-imidazolyl side-chains, glycerol and dyes of formulae III, IV, V or VI.

Accordingly, the combined disclosures of Bates '999, Breton '827, Nigam '025 and Schwarz '150 fail to render obvious the presently claimed invention. Although each of the cited references individually may disclose bits and pieces of the claimed inks, the present invention, taken as a whole, is not suggested in the prior art. Accordingly, the §103(a) rejection based on the combination of Bates '999, Breton '827, Nigam '025 and Schwarz '150 should be withdrawn.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly requested. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683 at her earliest convenience.

Respectfully submitted,

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Date: January 17, 2003

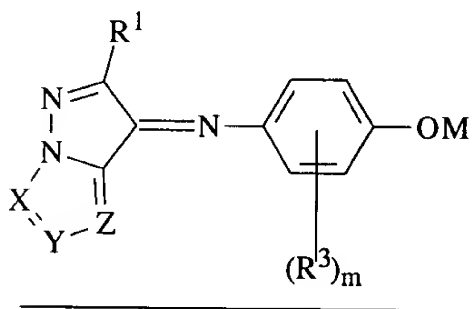
Attachment to AMENDMENT dated January 17, 2003

Marked-up Claims 1 and 9

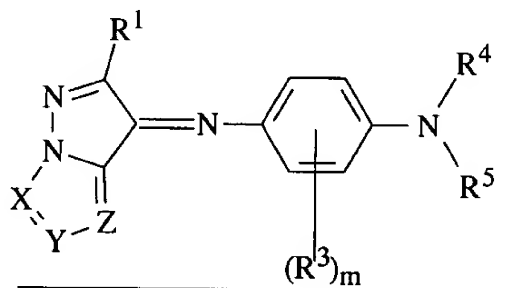
Please replace claims 1 and 9 as follows:

1. (Six Times Amended) A jet printing ink comprising a dye and an aqueous medium, which further comprises glycerol and a basic polymer having a side-chain containing 1-imidazolyl, said dye being dissolved in the aqueous medium, wherein the basic polymer is contained in an amount of 0.1 to 50 weight % and the ink has a viscosity of 50 cp or lower at 25°C, [and] wherein glycerol is contained in an amount of not less than 2 weight %, and wherein the dye is an azomethine dye of the following formula (III) or (IV) or an azo dye of the following formula (V) or (VI) or mixtures thereof:

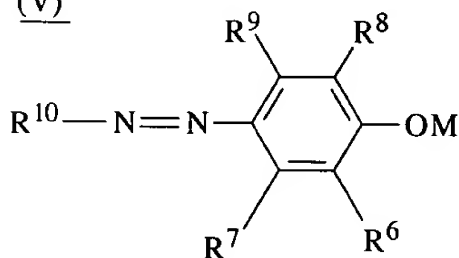
(III)



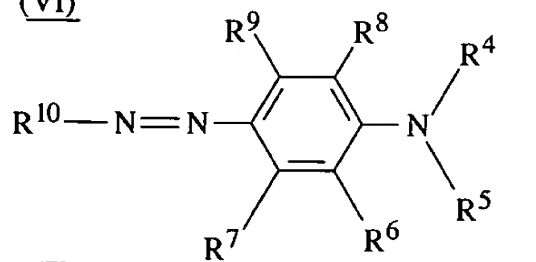
(IV)



(V)



(VI)



Attachment to AMENDMENT dated January 17, 2003

Marked-up Claims 1 and 9

in which each of R¹ and R³ independently is a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, cyano, amido, sulfonamido, ureido, an alkoxycarbonylamino group, an alkylthio group, an arylthio group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, an acyl group, an amino group, or an alkylamino group; m is 0, 1, 2, 3, or 4; each of X, Y and Z independently is =N- or =CR²-, in which R² is a hydrogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, a heterocyclic group, an alkoxy group, or an aryloxy group; in the case that both of X and Y are =CR²-, these two R² can be combined to form a ring; M is a hydrogen atom, a dissociated inorganic base, a primary amine, a secondary amine, or a tertiary amine; each of R⁴ and R⁵ independently is a hydrogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, or an aryl group; otherwise a set of R⁴ and R⁵, a set of R³ and R⁴ or a set of R³ and R⁵ are combined to form a ring; each of R⁶, R⁷, R⁸ and R⁹ independently is a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, a heterocyclic group, cyano, hydroxyl, nitro, amino, an alkylamino, an alkoxy group, an aryloxy group, amido, an arylamino group, ureido, sulfamoylamino, an alkylthio group, an alkoxycarbonyl group, a heterocyclic ring-oxy group, an azo group, an acyloxy group, a carbamoyloxy group, a silyloxy group, an aryloxycarbonyl group, an aryloxycarbonylamino group, an imido group, a heterocyclic

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Marked-up Claims 1 and 9

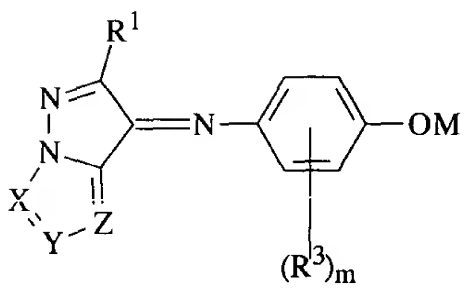
ring-thio group, sulfinyl, phosphoryl, an acyl group, carboxyl or sulfo; otherwise R⁸ and R⁹ are combined to form an aromatic ring or a heterocyclic ring; and R¹⁰ is an unsaturated heterocyclic ring.

9. (Five Times Amended) A method of forming an ink image on a receiving sheet using an ink jet printer, which comprises jetting drops of an ink comprising a dye and an aqueous medium which further comprises glycerol and a basic polymer having a side-chain containing 1-imidazolyl, said dye being dissolved in the aqueous medium, wherein the basic polymer is contained in an amount of 0.1 to 50 weight %, and the ink has a viscosity of 50 cp or lower at 25°C, [and] wherein glycerol is contained in the ink in an amount of not less than 2 weight %, and wherein the dye is an azomethine dye of the following formula (III) or (IV) or an azo dye of the following formula (V) or (VI) or mixtures thereof:

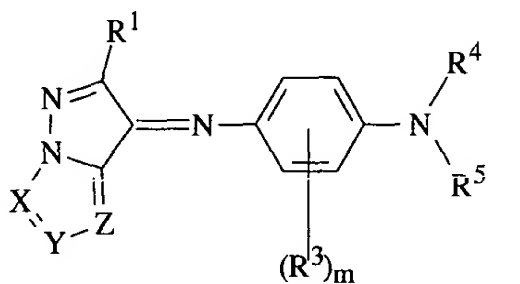
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Marked-up Claims 1 and 9

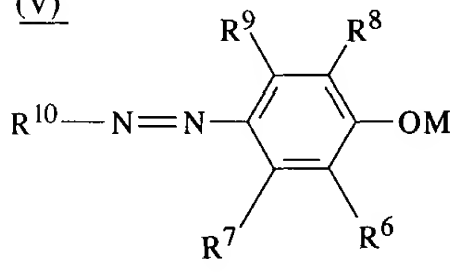
(III)



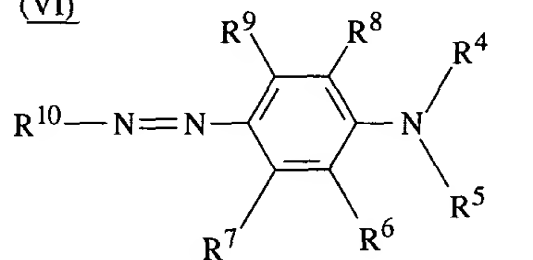
(IV)



(V)



(VI)



in which each of R^1 and R^3 independently is a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, cyano, amido, sulfonamido, ureido, an alkoxycarbonylamino group, an alkylthio group, an arylthio group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, an acyl group, an amino group, or an alkylamino group; m is 0, 1, 2, 3, or 4; each of X , Y and Z independently is $=N-$ or $=CR^2-$, in which R^2 is a hydrogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, a heterocyclic group, an alkoxy group, or an aryloxy group;

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Marked-up Claims 1 and 9

in the case that both of X and Y are =CR²-, these two R² can be combined to form a ring;
M is a hydrogen atom, a dissociated inorganic base, a primary amine, a secondary amine,
or a tertiary amine; each of R⁴ and R⁵ independently is a hydrogen atom, an alkyl group, a
cycloalkyl group, an aralkyl group, or an aryl group; otherwise a set of R⁴ and R⁵, a set of
R³ and R⁴ or a set of R³ and R⁵ are combined to form a ring; each of R⁶, R⁷, R⁸ and R⁹
independently is a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an
aralkyl group, an aryl group, a heterocyclic group, cyano, hydroxyl, nitro, amino, an
alkylamino, an alkoxy group, an aryloxy group, amido, an arylamino group, ureido,
sulfamoylamino, an alkylthio group, an alkoxycarbonyl group, a heterocyclic ring-oxy
group, an azo group, an acyloxy group, a carbamoyloxy group, a silyloxy group, an
aryloxycarbonyl group, an aryloxycarbonylamino group, an imido group, a heterocyclic
ring-thio group, sulfinyl, phosphoryl, an acyl group, carboxyl or sulfo; otherwise R⁸ and
R⁹ are combined to form an aromatic ring or a heterocyclic ring; and R¹⁰ is an unsaturated
heterocyclic ring.